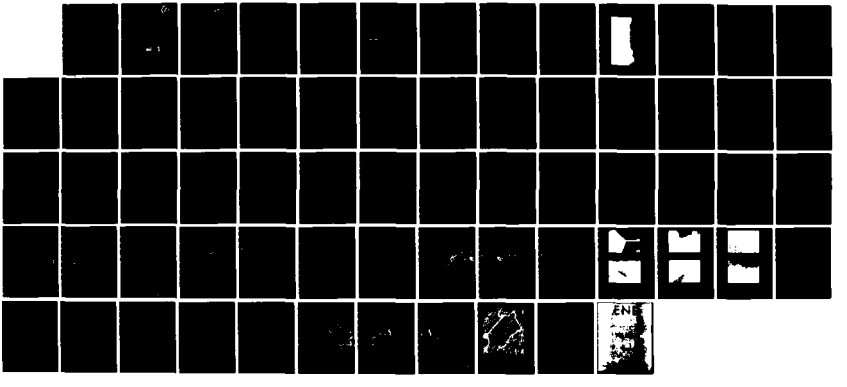
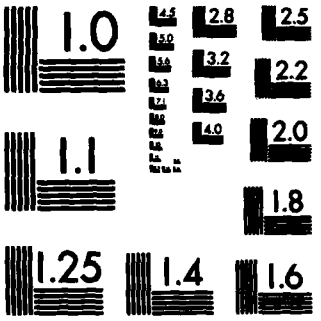
AD-A144 259 NATIONAL PROGRAM FOR INSPECTION OF NON-FEDERAL DAMS 1/1
BATTERSON PARK POND D.. (U) CORPS OF ENGINEERS WALTHAM
MA NEW ENGLAND DIV DEC 78

UNCLASSIFIED F/G 13/13 NL





CONNECTICUT RIVER BASIN

FARMINGTON/NEW BRITAIN, CONNECTICUT

BATTERSON PARK POND DAM
CT. 00262

PHASE I INSPECTION REPORT
NATIONAL DAM INSPECTION PROGRAM

DEPARTMENT OF THE ARMY
NEW ENGLAND DIVISION, CORPS OF ENGINEERS
WALTHAM, MASS. 02154

DECEMBER 1978

UNCLASSIFIED
SECURITY CLASSIFICATION OF THIS PAGE (When Data Entered)

REPORT DOCUMENTATION PAGE	READ INSTRUCTIONS BEFORE COMPLETING FORM
1. REPORT NUMBER: CT 00262	2. GOVT ACCESSION NO.: AD A079267
3. RECIPIENT'S CATALOG NUMBER:	
4. TITLE (and Subtitle): Batterson Park Pond Dam NATIONAL PROGRAM FOR INSPECTION OF NON-FEDERAL DAMS	5. TYPE OF REPORT & PERIOD COVERED: INSPECTION REPORT
	6. PERFORMING ORG. REPORT NUMBER:
7. AUTHOR(s): U.S. ARMY CORPS OF ENGINEERS NEW ENGLAND DIVISION	8. CONTRACT OR GRANT NUMBER(s):
9. PERFORMING ORGANIZATION NAME AND ADDRESS:	10. PROGRAM ELEMENT, PROJECT, TASK AREA & WORK UNIT NUMBERS:
11. CONTROLLING OFFICE NAME AND ADDRESS: DEPT. OF THE ARMY, CORPS OF ENGINEERS NEW ENGLAND DIVISION, NEDED 424 TRAPELO ROAD, WALTHAM, MA. 02254	12. REPORT DATE: December 1978 13. NUMBER OF PAGES: 45
14. MONITORING AGENCY NAME & ADDRESS (if different from Controlling Office):	15. SECURITY CLASS. (of this report): UNCLASSIFIED 15a. DECLASSIFICATION/DOWNGRADING SCHEDULE:

16. DISTRIBUTION STATEMENT (of this Report)

APPROVAL FOR PUBLIC RELEASE: DISTRIBUTION UNLIMITED

17. DISTRIBUTION STATEMENT (of the abstract entered in Block 20, if different from Report)

18. SUPPLEMENTARY NOTES

Cover program reads: Phase I Inspection Report, National Dam Inspection Program; however, the official title of the program is: National Program for Inspection of Non-Federal Dams; use cover date for date of report.

19. KEY WORDS (Continue on reverse side if necessary and identify by block number)

DAMS, INSPECTION, DAM SAFETY,

Connecticut River Basin
Farmington/New Britain, Connecticut

20. ABSTRACT (Continue on reverse side if necessary and identify by block number)

The Batterson Park Pond Dam is an earthfill embankment with stone masonry core that is 1,300 ft. long and 30 ft. high with a 35 ft. wide spillway. Based on visual inspection, hydraulic computations and past operational performance, the dam is judged to be in poor condition. The dam is classified as intermediate in size and has a high hazard potential based on downstream habitation.

DD FORM 1 JAN 73 1473 EDITION OF 1 NOV 65 IS OBSOLETE

NATIONAL DAM INSPECTION PROGRAM

PHASE I INSPECTION REPORT

Identification Number:	CT 00262
Name:	Batterson Park Pond Dam
Town:	Farmington/New Britain
County and State:	Hartford County, Connecticut
Stream:	Piper Brook
Date of Inspection:	September 29, 1978

BRIEF ASSESSMENT

The Batterson Park Pond Dam is an earthfill embankment with stone masonry core that is 1,300 feet long and 30 feet high with a 35 foot wide spillway. It has two, 20 inch blowoffs as well as a line to an adjacent fire hydrant. The dam is classified as intermediate in size and has a high hazard potential based on downstream habitation.

Based on visual inspection, hydraulic computations and past operational performance, the dam is judged to be in poor condition. Areas of the dam should be studied in order to monitor its behavior such as the central downstream slope which is swampy and shows considerable seepage and the deteriorated spillway channel.

The drainage area contributing to the dam is 4.68 square miles. The routed test flood peak outflow (Probable Maximum Flood) is 5,295 cfs which will overtop the dam by 1.21 feet. The project will pass only 29 percent of this peak outflow before overtopping the dam.

Recommended measures to be undertaken by the owner include a seepage investigation program, instrumentation observation and studies of various ways to increase spillway capacity as well as several remedial steps discussed later. The owner shall implement the recommendations and remedial measures described in Section 7 within one year after receipt of this Phase I Inspection Report.

Joseph F. Merluzzo
Connecticut P.E. #7639
Project Manager

Richard F. Lyon
Connecticut P.E. #8443
Project Engineer

This Phase I Inspection Report on Batterson Park Pond Dam has been reviewed by the undersigned Review Board members. In our opinion, the reported findings, conclusions, and recommendations are consistent with the Recommended Guidelines for Safety Inspection of Dams, and with good engineering judgment and practice, and is hereby submitted for approval.

Charles G. Tiersch

CHARLES G. TIERSCH, Chairman
Chief, Foundation and Materials Branch
Engineering Division

Fred J. Ravens Jr

FRED J. RAVENS, Jr., Member
Chief, Design Branch
Engineering Division

Saul Cooper

SAUL COOPER, Member
Chief, Water Control Branch
Engineering Division

APPROVAL RECOMMENDED:

Joe B. Fryar

JOE B. FRYAR
Chief, Engineering Division

PREFACE

This report is prepared under guidance contained in the Recommended Guidelines for Safety Inspection of Dams, for Phase I Investigations. Copies of these guidelines may be obtained from the Office of Chief of Engineers, Washington, D.C. 20314. The purpose of a Phase I Investigation is to identify expeditiously those dams which may pose hazards to human life or property. The assessment of the general condition of the dam is based upon available data and visual inspections. Detailed investigations and analyses involving topographic mapping, subsurface evaluations, testing, and detailed computational evaluations are beyond the scope of a Phase I Investigation; however, the investigation is intended to identify the need for such studies.

In reviewing this report, it should be realized that the reported condition of the dam is based on observations of field conditions at the time of inspection along with data available to the inspection team. In cases where the reservoir was lowered or drained prior to inspection, such action, while improving the stability and safety of the dam, removes the normal load on the structure and may obscure certain conditions which might otherwise be detectable if inspected under the normal operating environment of the structure.

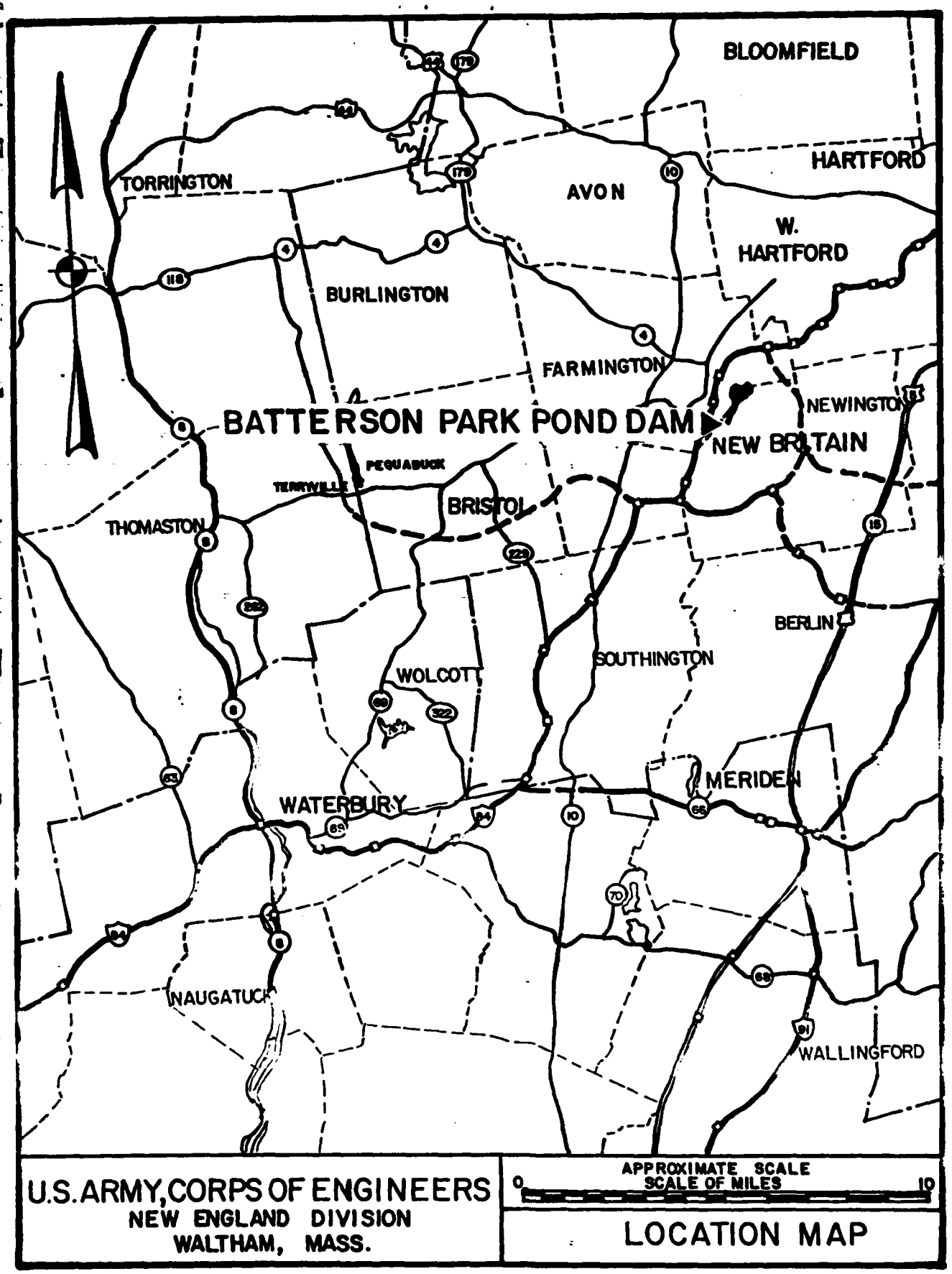
It is important to note that the condition of a dam depends on numerous and constantly changing internal and external conditions, and is evolutionary in nature. It would be incorrect to assume that the present condition of the dam will continue to represent the condition of the dam at some point in the future. Only through continued care and inspection can there be any chance that unsafe conditions be detected.

Phase I Inspections are not intended to provide detailed hydrologic and hydraulic analyses. In accordance with the established Guidelines, the Spillway Test Flood is based on the estimated "Probable Maximum Flood" for the region (greatest reasonably possible storm runoff), or fractions thereof. Because of the magnitude and rarity of such a storm event, a finding that a spillway will not pass the test flood should not be interpreted as necessarily posing a highly inadequate condition. The test flood provides a measure of relative spillway capacity and serves as an aide in determining the need for more detailed hydrologic and hydraulic studies, considering the size of the dam, its general condition and the downstream damage potential.

TABLE OF CONTENTS

TABLE OF CONTENTS (CONTINUED)

OVERVIEW PHOTO


BLOOMFIELD
HARTFORD
TORRINGTON
AVON
W.
HARTFORD
BURLINGTON
FARMINGTON
BATTERSON PARK POND DAM
NEWINGTON
NEW BRITAIN
PEQUABUCK
TERRYVILLE
BRISTOL
THOMASTON
BERLIN
SOUTHINGTON
WOLCOTT
MERIDEN
WATERBURY
NAUGATUCK
WALLINGFORD
U.S. ARMY, CORPS OF ENGINEERS
NEW ENGLAND DIVISION
WALTHAM, MASS.
APPROXIMATE SCALE
SCALE OF MILES
0
10
LOCATION MAP

PHASE I INSPECTION REPORT

BATTERSON PARK POND CT 00262

SECTION 1 - PROJECT INFORMATION

1.1 General

a. Authority - Public Law 92-367, August 8, 1972 authorized the Secretary of the Army, through the Corps of Engineers, to initiate a National Program of Dam Inspection throughout the United States. The New England Division of the Corps of Engineers has been assigned the responsibility of supervising the inspection of dams within the New England Region. Storch Engineers has been retained by the New England Division to inspect and report on selected dams in the State of Connecticut. Authorization and notice to proceed were issued to Storch Engineers under a letter of May 3, 1978 from Ralph T. Garver, Colonel, Corps of Engineers. Contract No. DACW33-78-C-0000 has been assigned by the Corps of Engineers for this work.

b. Purpose -

(1) Perform technical inspection and evaluation of non-Federal dams to identify conditions which threaten the public safety and thus permit correction in a timely manner by non-Federal interests.

(2) Encourage and prepare the states to initiate quickly, effective dam safety programs for non-Federal dams.

(3) To update, verify and complete the National Inventory of Dams.

1.2 Description of Project

a. Location - Batterson Park Pond Dam is located approximately 8 miles southwest of Hartford in the Town of Farmington and the City of New Britain, Hartford County, Connecticut.

b. Description of Dam and Appurtenances - The structure is an earth dam that is approximately 1,300 feet long and 30 feet high with a spillway approximately 35 feet wide. Originally there was a gate house to control two, 20 inch blowoffs but it has since been demolished. The blowoffs are still operable however.

c. Size Classification - The size classification of the dam is intermediate. The storage (2,520 acre-feet) governs the classification per the criteria set forth in the Recommended Guidelines for Safety Inspection Of Dams (intermediate - greater than 1,000 and less than 50,000 acre-feet) by the Corps of Engineers.

d. Hazard Classification - The hazard classification is high per the criteria set forth in the guidelines mentioned in Section 1.2.c. Failure of this dam would result in the

inundation of several residential dwellings as well as several buildings of an apartment complex in the City of New Britain (Appendix D, Plate 4).

e. Ownership - The Batterson Park Pond Dam is owned by the City of Hartford, Connecticut. The pond and dam were originally owned by the Hartford Waterworks, now the Metropolitan District Commission, Hartford, Connecticut.

f. Operator - The person in charge of day to day operation of the dam is Charles Meli, Parks Department, Department of Public Works, Hartford, Connecticut 06103; Telephone Number: 566-6606.

g. Purpose of Dam - The dam impounds Batterson Park Pond which serves as a recreation facility for the greater Hartford and New Britain area.

h. Design and Construction History - The Batterson Park Pond Dam was constructed in 1878. There are no design computations available, however, two plan sheets which showed details of construction were furnished by the Water Bureau of the Metropolitan District, Hartford, Connecticut.

i. Normal Operational Procedures - Normal operational procedures are performed by maintenance personnel from the City of Hartford, Recreation Department and consists of the lowering of the pond just after the summer season and during periods of heavy rainfall.

1.3 Pertinent Data

a. Drainage Area - A 4.68 square mile drainage area contributes to the dam. Part of this drainage area (1.88 square miles) is controlled by a swamp that is protected from development by public law. The rest of the drainage area is predominantly residential with some open space.

b. Discharge at Damsite - The maximum known spillway discharge was approximately 1,120 cfs during the flood of August, 1955.

(1) Outlet works: (conduits) 2-20 inch, invert elevations unknown.

(2) Maximum known flood at damsite: 1,120 cfs.

(3) Ungated spillway capacity at maximum pool elevation: 1,540 cfs at 312.6 elevation.

(4) Gated spillway capacity at pool elevation: N/A cfs at N/A elevation.

(5) Gated spillway at maximum pool elevation: N/A cfs at N/A elevation.

(6) Total spillway at maximum pool elevation: 1,540 cfs at 312.6 elevation.

c. Elevation (Feet above MSL)

(1) Top of dam: 312.6

(2) Maximum pool-design surcharge: 312.6

(3) Full flood-control pool: N/A

(4) Recreation pool: N/A

(5) Spillway crest: 307

(6) Upstream portal invert diversion tunnel: unknown

(7) Streambed at centerline of dam: 282.6

(8) Maximum tailwater: 287

d. Reservoir

(1) Length of maximum pool: 4,000 feet ±

(2) Length of recreation pool: N/A

(3) Length of flood-control pool: N/A

e. Storage (Acre-Feet)

(1) Recreation pool: N/A

(2) Flood-control pool: N/A

(3) Design surcharge: 2,600

(4) Top of dam: 2,600

f. Reservoir Surface (Acres)

(1) Top of dam: 168

(2) Maximum pool: 168

(3) Flood-control pool: N/A

(4) Recreation pool: N/A

(5) Spillway crest: 150

g. Dam

(1) Type: Earth embankment

(2) Length: 1,300 feet ±

(3) Height: 30 feet ±

(4) Top width: 30 feet ±

(5) Side slopes: U/S 1:3; D/S 1:2

(6) Zoning: Unknown

(7) Impervious Core: Stone masonry

(8) Cutoff: unknown

(9) Grout curtain: unknown

(10) Other: N/A

h. Diversion and Regulating Tunnel

(1) Type: cast iron pipe

(2) Length: unknown

(3) Closure: N/A

(4) Access: none

(5) Regulating Facilities: 2-20 inch blowoffs, manually operated.

i. Spillway

(1) Type: concrete fixed weir

(2) Length of weir: 35 feet

(3) Crest elevation: 307

(4) Gates: none

(5) U/S channel: riprap channel

(6) D/S channel: riprap channel

(7) General: N/A

j. Regulating Outlets

Regulating outlets consist of a 20 inch blowoff that discharges just below the dam and a 20 inch water main to a local fire hydrant.

(1) Invert: unknown

(2) Size: 20 inch

(3) Description: cast iron

(4) Control mechanism: manually operated gate valve

(5) Other: N/A

SECTION 2 - ENGINEERING DATA

2.1 Design

This facility was built in 1878. There is no design information available. The City of Hartford, Engineering Department acquired this dam from the Metropolitan District Commission (MDC) and since that time has conducted two hydrologic studies (Appendix B, References 4 and 5) and a topographic survey of the area is presently being completed by the MDC.

2.2 Construction

There are no records or photographs available of the 1878 construction.

2.3 Operation

The water level in the reservoir is controlled by valves which are at the toe of the dam. There is no mechanical operation of the dam other than the hand operated valves for the lines to the blowoff, and discharge channel and to the fire hydrant.

2.4 Evaluation

a. Availability - Topographic drawings were provided by the Department of Public Works. Because of the age of the dam, there was no design information. The dam has no procedures in case of overtopping.

b. Adequacy - The information that was made available was only a minor factor in the assessment which was based mainly on the visual inspection, past performance history and hydrologic and hydraulic assumptions.

c. Validity - The topographic drawings are accurate to the extent that the visual inspection did not reveal any new features.

SECTION 3 - VISUAL INSPECTION

3.1 Findings

a. General - The visual inspection was conducted on September 29, 1978 by members of the engineering staff of Storch Engineers. A copy of the visual inspection check list is contained in Appendix A of this report.

Before the inspection, cross sections of the dam that had recently been done as well as other hydrologic information that was made available from the City of Hartford, Public Works Department were studied. A compact sketch of the dam was made for orientation during the inspection (Appendix B, Plate 1).

In general, the overall appearance and condition of the dam is poor.

b. Dam - According to the data sheet supplied by the Metropolitan District Commission, Engineering Department, the body of the dam is composed of earth fill with a stone masonry core. The crest of the dam has a dirt road which is used by the maintenance section of the Parks and Recreation Department as well as mini-bikes and other recreational vehicles. The face of the dam is overgrown with vegetation and is irregular with several areas along the slope that have eroded. Several areas on the upstream face that had eroded were above the riprap protection and were several

cubic yards in size. These eroded areas appear to have been caused by trespassing. Riprap failure was only minor in these areas.

The lower part of the dam shows several signs of seepage with water being observed from as high as three (3) feet up from the toe of the slope (Appendix C, Photos 7 and 8). The total seepage discharge is approximately 10 to 15 gallons per minute. A marshy area is denoted on Plate 1 and shown in Appendix C, Photo 6. Some of the spots where seepage was measured had fairly substantial flows with minor deposits of redish color sediment and are shown in Appendix C, Photo 8.

c. Appurtenant Structures - The appurtenant structures are the spillway (Appendix C, Photo 2) and the gate house which has been partially removed from the pond area. It was not clear exactly what happened to the gate house or the walkway which went to it. The spillway is overgrown and spalled with some cracks but there are no major signs of distress or movement (Appendix C, Photo 2). Since there are gate valves at the outlets of the blowoff, the removal of the gate house has caused the full head to be placed on the pipes. This, however, does appear to be within the design limits. These outlet gate valves are operable. The valves are exercised every year to lower the pond in the fall. The day before the inspection, maintenance personnel from the City of Hartford had opened the gate for the blowoff to start this drawdown process.

d. Reservoir Area - Inspection of the area adjacent to the embankment of the dam showed it to be generally very rolling terrain. There were no signs of embankment movement at either end of the dam.

e. Downstream Channel - The downstream channel of the spillway (Appendix C, Photo 4) is overgrown with trees. It is very difficult to define its actual location. The channel seems to follow the natural fall and presently has slope protection which is entirely overgrown. It does not flow except during periods of heavy rain.

3.2 Evaluation

Overall, the general physical condition of the dam and appurtenant structures based on the results of the visual inspection is poor.

The observation of the extensive zone of seepage on the downstream slope of the dam indicates a need for further study so that the extent of this problem can be defined.

SECTION 4 - OPERATIONAL PROCEDURES

4.1 Procedures

The responsibility for maintenance is with the City of Hartford, Parks and Recreation Department with engineering and construction assistance from the Public Works Department. There is no formal procedure for lowering the reservoir during seasons of heavy rain, however, the pond is drawn down after each summer season. The valves at the toe of the dam are opened during periods of drawdown as well as during periods of unusually heavy rain.

4.2 Maintenance of Dam

There is no routine maintenance, however, some attempts have been made to keep the face of the dam and spillway channel clear of trees and brush. The clearing has not been undertaken for years and the maintenance of the spillway weir has also been neglected.

4.3 Maintenance of Operating Facilities

There are no regular procedures for maintenance of the operating facilities.

4.4 Description of Warning System

There is no warning system in effect.

4.5 Evaluation

In view of the lack of routine maintenance procedures, it is suggested that a complete program be established. There has been no recent effort made to clean-up the downstream area or to repair damage to the body of the dam itself.

SECTION 5 - HYDRAULIC/HYDROLOGIC

5.1 Evaluation of Features

a. Design Data - The 35 foot spillway and the two, 20 inch blowoffs are the only means of transmitting water past the dam. Under conditions of the test flood (Probable Maximum Flood), the spillway will carry only a portion of the flood water.

Using the guide curves supplied by the Corps of Engineers (rolling terrain), the test flood peak inflow into the reservoir is 8,892 cfs (1,900 cfs/sm x 4.68 sm). However, just upstream of Batterson Park Pond is Dead Wood Swamp which controls 1.98 square miles of the total 4.69 square miles in the watershed and under Public Law 566, this area cannot be developed. With this in mind, the test flood peak inflow was reduced to 7,020 cfs (1,500 cfs/sm x 4.68 sm) and the routed outflow is 5,295 cfs. The pond elevation at the test flood peak outflow is 313.81 or 1.21 feet over the top of the dam. The spillway capacity at the top of the dam is only 1,540 cfs, approximately 29 percent of the test flood peak outflow (Appendix D).

b. Experience Data - The Batterson Park Pond Dam has experienced the floods of November, 1927; March, 1936;

September, 1938 and August (maximum) and October, 1955. During the flood of August, 1955, the elevation of the pond was 311.75 feet and the discharge was approximately 1,120 cfs.

c. Visual Observations - The spillway at the time of the inspection was in poor condition with the spillway channel in need of cleaning (Appendix C, Photo 2).

The river channel downstream is overgrown with trees and brush and is not conducive to the free passage of flood flows.

The 20 inch blowoffs are operable.

d. Overtopping Potential - Calculations by Storch Engineers indicates that the test flood outflow will overtop the dam by 1.21 feet.

SECTION 6 - STRUCTURAL STABILITY

6.1 Evaluation of Structural Stability

a. Visual Observation - There have been no routine inspections conducted by the staff of the Hartford Department of Public Works. In April of 1975, the dam was inspected by personnel of the State of Connecticut, Department of Environmental Protection. This visual inspection showed that although the structural stability of the dam appears adequate there are several soft and swampy areas on the downstream slope with visible seepage flows approximately three feet up from the toe.

b. Design and Construction Data - The design and construction data available were two original construction drawings, hydrological data and conversations with M.D.C. and the City of Hartford's personnel.

c. Operating Records - There are no operating records for the dam. The water level of Batterson Park Pond is not monitored.

d. Post Construction Changes - The following changes have been noted since the completion of the dam's construction in 1878:

(1) There has been an additional berm placed at the toe of the dam. The construction period and details of this work are not known;

(2) The removal of the gate house and its service bridge at the reservoir.

e. Seismic Stability - The dam is located in Seismic Zone 1 and in accordance with Recommended Phase I Guidelines does not warrant seismic analysis.

SECTION 7 - ASSESSMENT, RECOMMENDATIONS & REMEDIAL MEASURES

7.1 Dam Assessment

a. Condition - After consideration of the available documents, the results of this inspection, the hydraulic computations and the meetings with the resident staff, the general condition of the Batterson Park Pond Dam is judged to be poor.

There is a particular concern for the soft and swampy areas in the downstream slope with visible seepage streams and for the condition of the spillway channel.

b. Adequacy of Information - The information available is such that the assessment of the safety of the dam is based primarily on the visual inspection results and the past operational performance of the dam and its appurtenant structures.

c. Urgency - The owner shall implement recommendations within one year after receipt of this Phase I Inspection Report.

d. Need for Additional Investigation - Additional investigations should be performed by the owner as outlined in the following sections.

7.2 Recommendations

In view of the lack of engineering data for evaluating the dam's behavior, it is recommended that the following measures be implemented by the owner:

a. Monitoring of the dam for seepage including any necessary analyses or other pertinent studies.

b. Determination of the geometry of the dam, elevation of its base, properties of its components and its foundation rock should be made. This would permit an objective assessment of the structural stability of the dam;

c. Further detailed studies of the spillway capacity and an investigation into possible methods to increase the total project discharge capacity if this is found to be necessary.

The above recommendations should be done by a qualified registered professional engineer or engineering firm.

7.3 Remedial Measures

It is considered important that the following items be attended to as early as practical:

a. Alternatives - Not applicable.

b. O & M Maintenance and Procedures -

(1) Brush and trees on the upstream and downstream slopes of the dam should be removed to facilitate the visual observation of movement and the existing and potential seepage.

(2) Loose materials and brush should be cleaned from the spillway channel.

(3) Eroded portions of the top upstream slope of the dam should be filled and reinforced.

(4) Plans for around-the-clock surveillance should be undertaken for periods of unusually heavy rains and a formal warning system should be developed.

(5) A program of biennial periodic technical inspection should be established.

(6) Mini-bikes and recreational vehicles should be banned from riding on the dam.

(7) A method to prevent vandalism to the valve boxes and to the outlet gate valves should be devised.

APPENDIX A

VISUAL INSPECTION CHECK LIST A-1 to A-6

VISUAL INSPECTION CHECK LIST
PARTY ORGANIZATION

PROJECT Batterson Park Pond Dam

DATE 9-28-78

TIME 11:00 a.m.

WEATHER Cloudy

W.S. ELEV. _____ U.S. _____ DN.S.

PARTY:

1. Richard Lyon
2. Miron Petrovsky
3. Gary Giroux
4. John Schearer
5. Rodolfo Aloma
6. Ted Brindamour
7. _____
8. _____
9. _____
10. _____

	PROJECT FEATURE	INSPECTED BY	REMARKS
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			

PERIODIC INSPECTION CHECK LIST

PROJECT Batterson Park Pond Dam DATE 9-28-78

PROJECT FEATURE _____ NAME R. Lyon

DISCIPLINE _____ NAME G. Giroux

AREA EVALUATED	CONDITIONS
DAM EMBANKMENT	
Crest Elevation	Fair
Current Pool Elevation	Fair
Maximum Impoundment to Date	Fair
Surface Cracks	None observed
Pavement Condition	N/A
Movement or Settlement of Crest	None observed
Lateral Movement	None observed
Vertical Alignment	Fair but irregular
Horizontal Alignment	Fair but irregular
Condition at Abutment and at Concrete Structures	N/A
Indications of Movement of Structural Items on Slopes	N/A
Trespassing on Slopes	Not regularly patrolled
Sloughing or Erosion of Slopes or Abutments	Face of dam overrun with trail bikes
Rock Slope Protection - Riprap Failures	Intermitant riprap on u/s slope
Unusual Movement or Cracking at or near Toes	None observed
Unusual Embankment or Downstream Seepage	Friatic line up 3 feet from toe of dam
Piping or Boils	Fairly heavy seepage at toe of dam
Foundation Drainage Features	None
Toe Drains	None observed
Instrumentation	None

PERIODIC INSPECTION CHECK LIST

PROJECT Batterson Park Pond Dam DATE 9-28-78

PROJECT FEATURE _____ NAME R. Aloma

DISCIPLINE _____ NAME M. Petrovsky

AREA EVALUATED	CONDITION
OUTLET WORKS - INTAKE CHANNEL AND INTAKE STRUCTURE	UNDERWATER
a. Approach Channel	
Slope Conditions	
Bottom Conditions	
Rock Slides or Falls	
Log Boom	
Debris	
Condition of Concrete Lining	
Drains or Weep Holes	
b. Intake Structure	Original gate house structure has been razed
Condition of Concrete	
Stop Logs and Slots	

PERIODIC INSPECTION CHECK LIST

PROJECT Batterson Park Pond Dam DATE 9-28-78

PROJECT FEATURE _____ NAME J. Schearer

DISCIPLINE _____ NAME T. Brindamour

AREA EVALUATED	CONDITION
OUTLET WORKS - TRANSITION AND CONDUIT	
General Condition of Concrete	N/A two cast iron pipes provide
Rust or Staining on Concrete	Discharge line
Spalling	through dam
Erosion or Cavitation	
Cracking	
Alignment of Monoliths	Not observed
Alignment of Joints	Not observed
Numbering of Monoliths	N/A

PERIODIC INSPECTION CHECK LIST

PROJECT Batterson Park Pond Dam DATE 9-28-78

PROJECT FEATURE _____ NAME R. Lyon

DISCIPLINE _____ NAME M. Petrovsky

AREA EVALUATED	CONDITION
OUTLET WORKS - OUTLET STRUCTURE AND OUTLET CHANNEL	
General Condition of Concrete	N/A - valve boxes are accessible
Rust or Staining	to public with some
Spalling	problem of vandalism for
Erosion or Cavitation	valve box cover
Visible Reinforcing	
Any Seepage or Efflorescence	
Condition at Joints	
Drain holes	
Channel	
Loose Rock or Trees Overhanging Channel	Areas downstream of valve boxes
Condition of Discharge Channel	is overgrown with trees and brush

PERIODIC INSPECTION CHECK LIST

PROJECT Batterson Park Pond Dam DATE 9-28-78

PROJECT FEATURE _____ NAME R. Aloma

DISCIPLINE _____ NAME G. Giroux

AREA EVALUATED	CONDITION
OUTLET WORKS - SPILLWAY WEIR, APPROACH AND DISCHARGE CHANNELS	
a. Approach Channel	
General Condition	Fair to good
Loose Rock Overhanging Channel	Channel overgrown with
Trees Overhanging Channel	dense, heavy brush
Floor of Approach Channel	Fair to good
b. Weir and Training Walls	
General Condition of Concrete	Fair to good
Rust or Staining	N/A
Spalling	Some
Any Visible Reinforcing	None observed
Any Seepage or Efflorescence	None observed
Drain Holes	None
c. Discharge Channel	
General Condition	Fair to poor
Loose Rock Overhanging Channel	N/A
Trees Overhanging Channel	Numerous areas
Floor of Channel	Fair to poor
Other Obstructions	Area could not be walked

APPENDIX B

LIST OF REFERENCES

1. Drawings of the Batterson Park Pond Dam: (1) Transverse Section through Dam and Gate Chamber; (2) Inlet Tower and Gate House; Hartford Water Works; 1879.

2. Specifications for building reservoir No. 2; Hartford Water Works; 1879.

3. Topography sheet nos. 108, 109, 153 and 154 of the Batterson Park Pond and the surrounding area; The Metropolitan District; Hartford County, Connecticut; 1958.

4. Control of Floods in Park River; Part I; Park River Hydrology; Report to Greater Hartford Flood Commission; Metcalf & Eddy Engineering; Boston, Massachusetts; February, 1958.

5. Report on Channel Encroachment Lines and Flood Plain Delineation South Branch Park River; report by Anderson Nichols; 1965 for State of Connecticut; Department of Agriculture and Natural Resouces and Water Resources Commission.

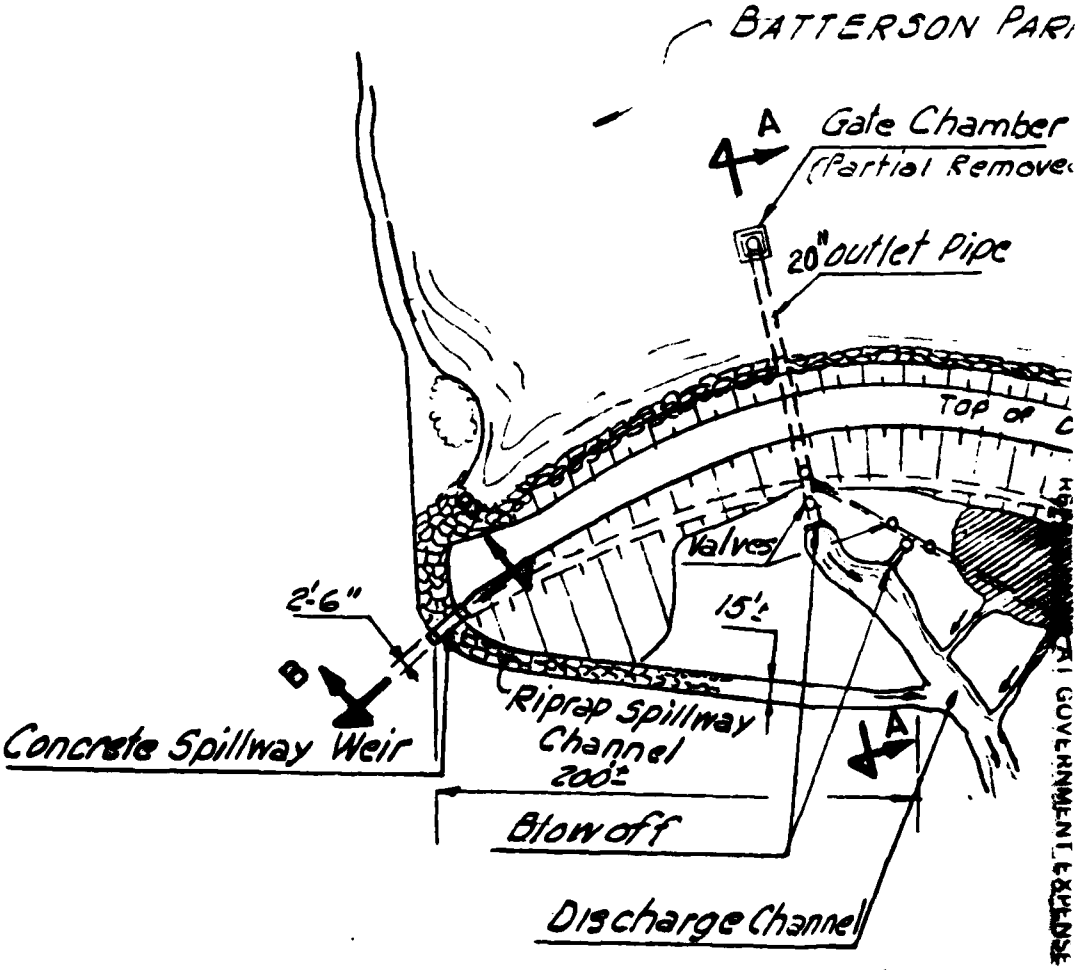
6. Recommended Guidelines for Safety Inspection of Dams; Department of the Army; Office of the Chief of Engineers; Washington, D.C.; November, 1976.

7. Guide Curves for the Probable Maximum Flood (PMF) for Regions of New England based on past Corps of Engineers' Studies; March, 1978.

8. Preliminary Guidance for Estimating Maximum Probable Discharges in Phase I Dam Safety Investigations; New England Division; Corps of Engineers; March, 1978.

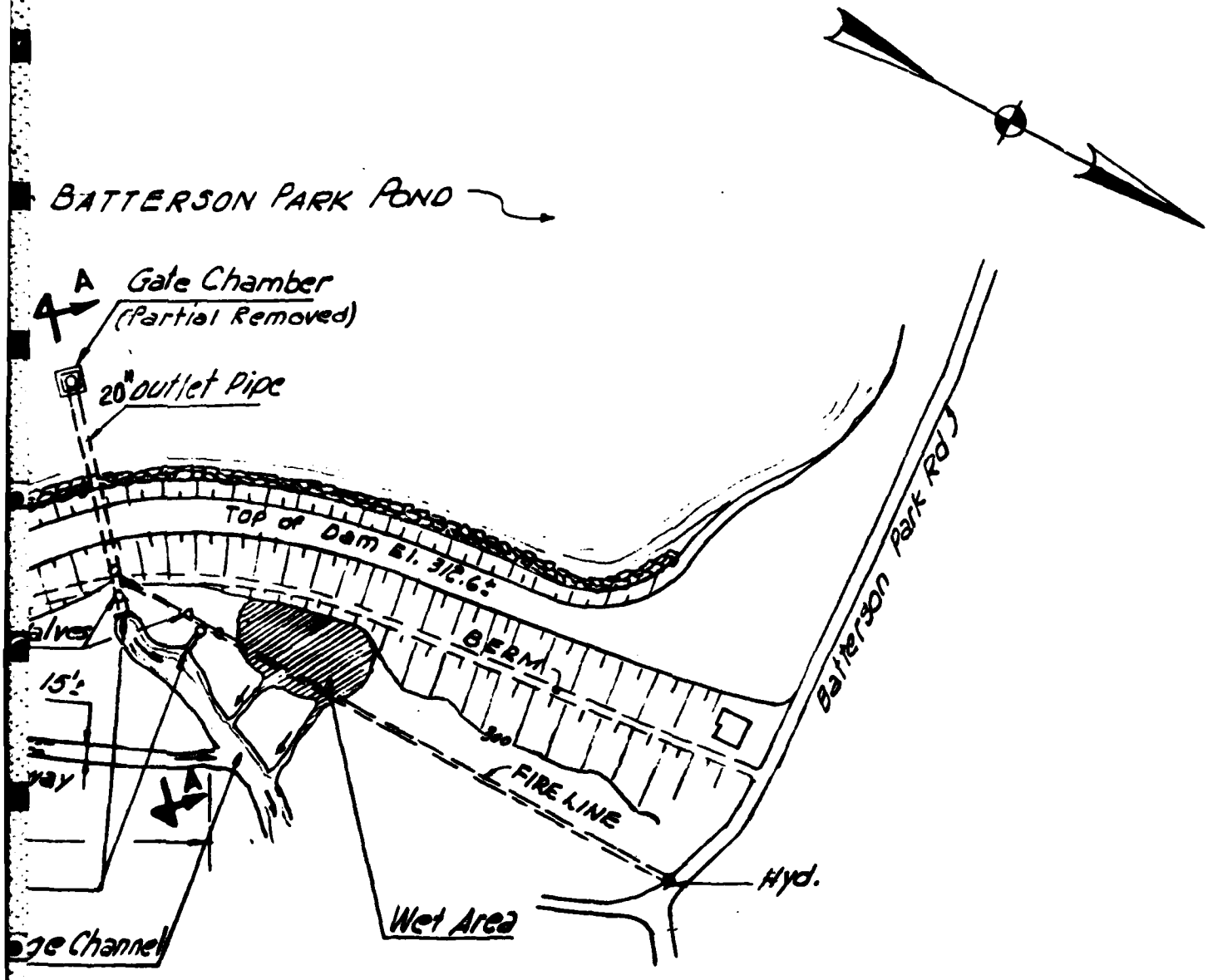
9. Rule of Thumb. Guidance for Estimating Downstream Dam Failure Hydrographs; Corps of Engineers; April, 1978.

10. Instrumentation of Earth and Rockfill Dams; EM 1110-2-1908; Department of the Army; Corps of Engineers; August, 1971.



PLAN

NOTE: INFORMATION TAKEN FROM DRAWINGS SUPPLIED BY THE METROPOLITAN DISTRICT COMMISSION OF HARTFORD.



PLAN

STORCH ENGINEERS WETHERSFIELD, CONNECTICUT	U.S.
NATIONAL PROGRAM OF INSPE	
BATTERSON PAR	
PIPER BROOK	
	SCA
	DAT

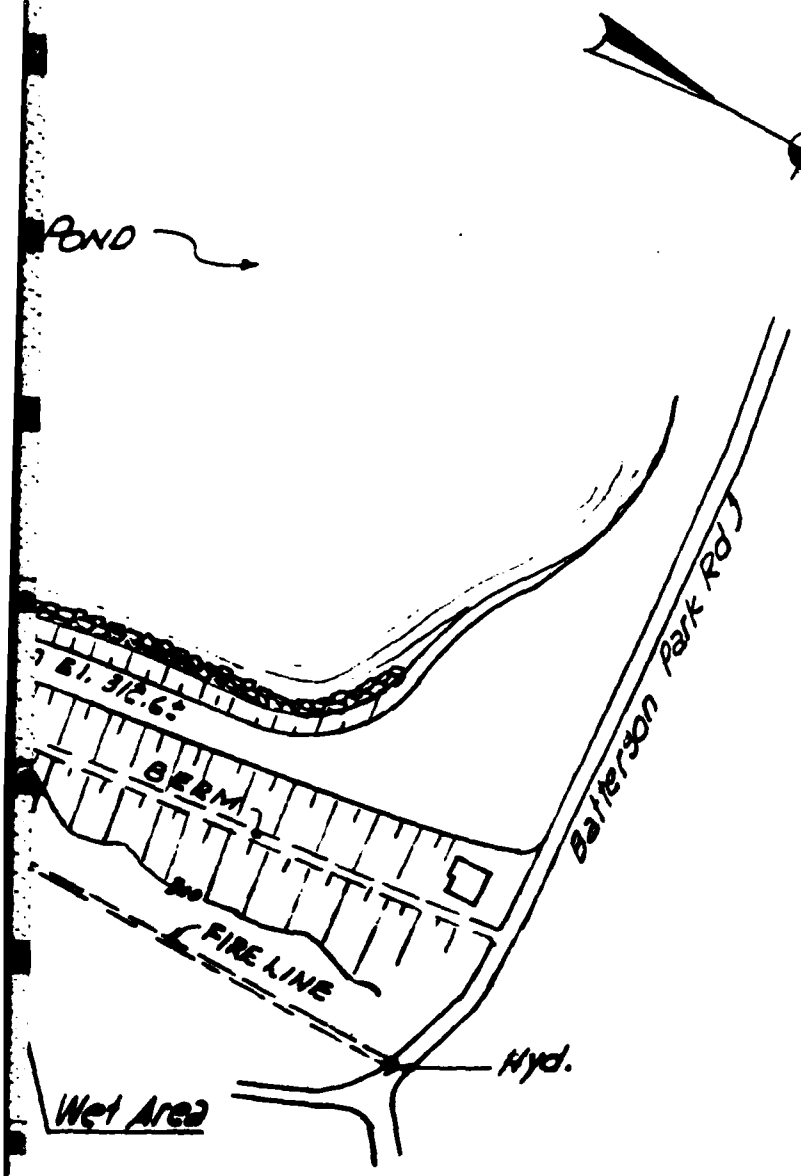


PLATE- 1

STORCH ENGINEERS WETHERSFIELD, CONNECTICUT	U.S. ARMY ENGINEER DIV. NEW ENGLAND CORPS OF ENGINEERS WALTHAM, MASS.

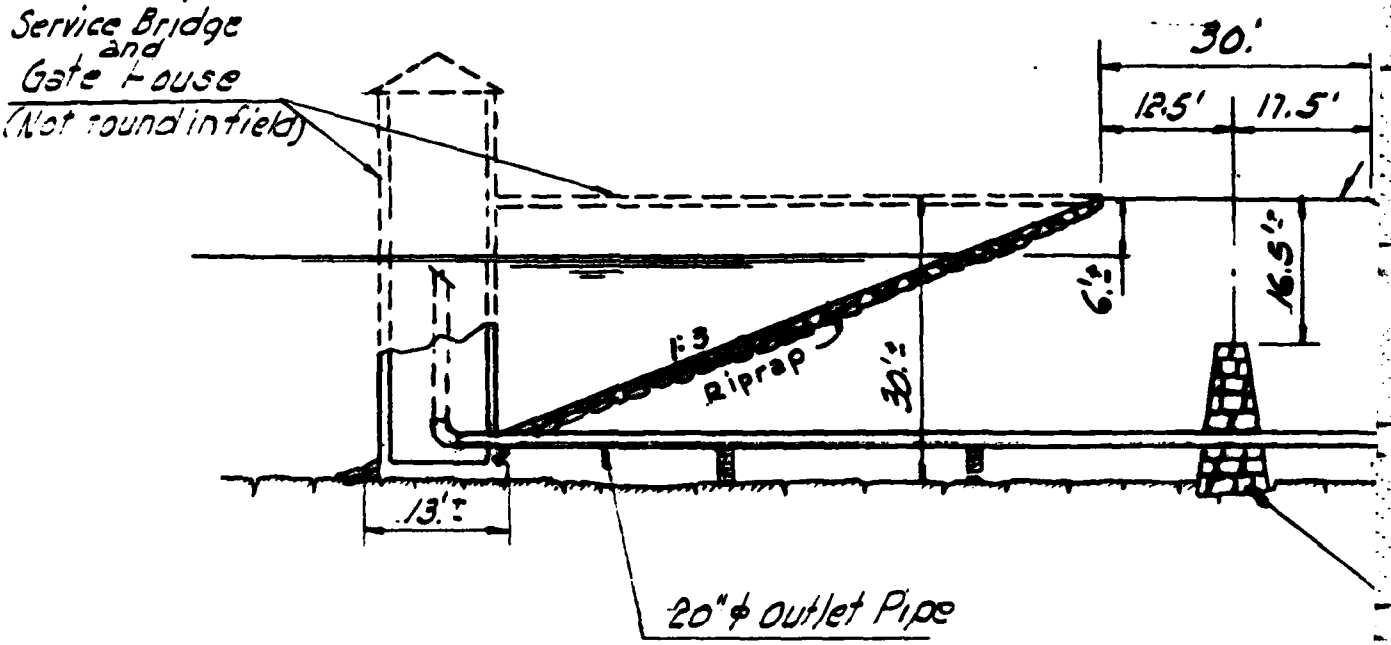
NATIONAL PROGRAM OF INSPECTION OF NON-FED. DAMS

BATTERSON PARK POND DAM

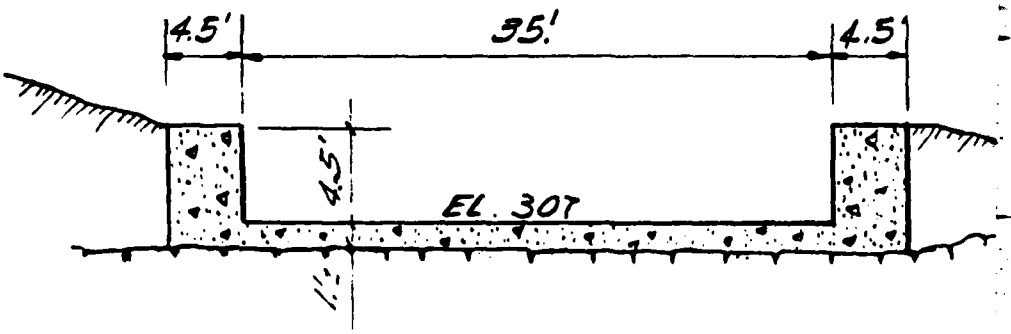
PIPER BROOK CONNECTICUT

SCALE: Not to Scale

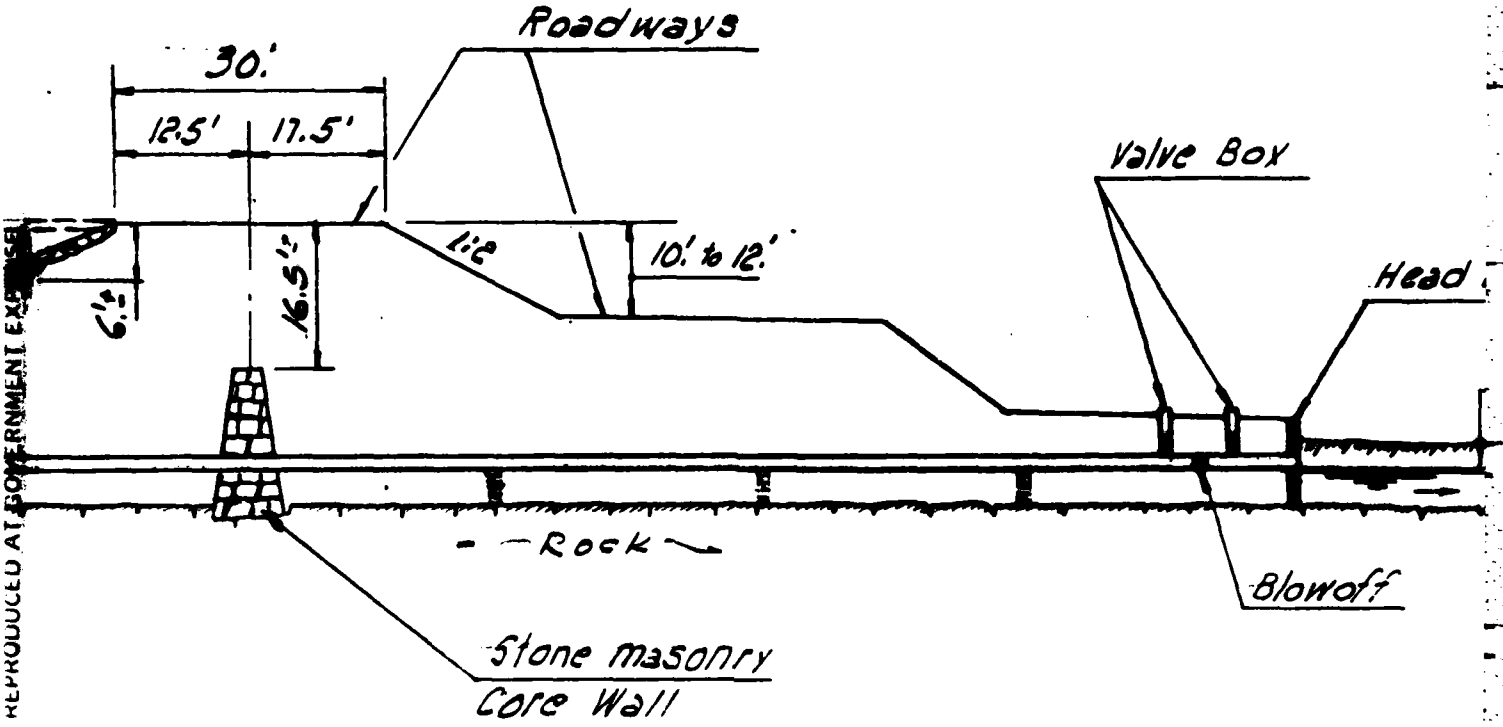
DATE : Nov. 1978



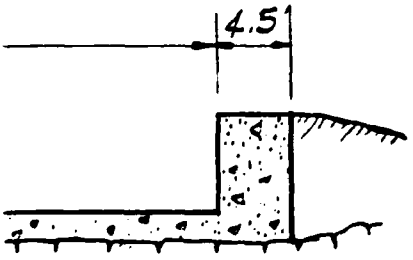
SECTION



SECTION B-B



SECTION A-A



B-B

2

STORCH ENGINEERS
WETHERSFIELD, CONNECTICUT

NATIONAL PROGRAM OF INSP

BATTERSON PA

PIPER BROOK

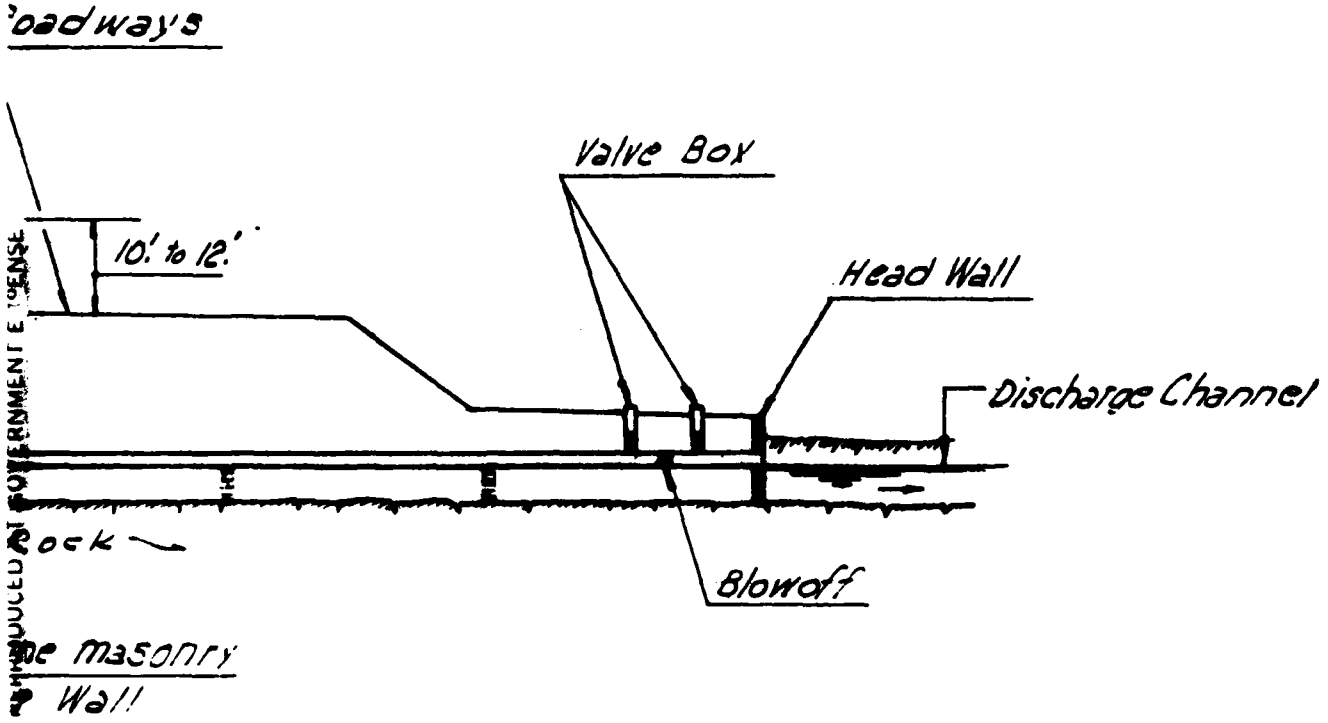


PLATE-2

STORCH ENGINEERS WETHERSFIELD, CONNECTICUT	U.S. ARMY ENGINEER DIV. NEW ENGLAND CORPS OF ENGINEERS WALTHAM, MASS.

NATIONAL PROGRAM OF INSPECTION OF NON-FED. DAMS

BATTERSON PARK POND DAM

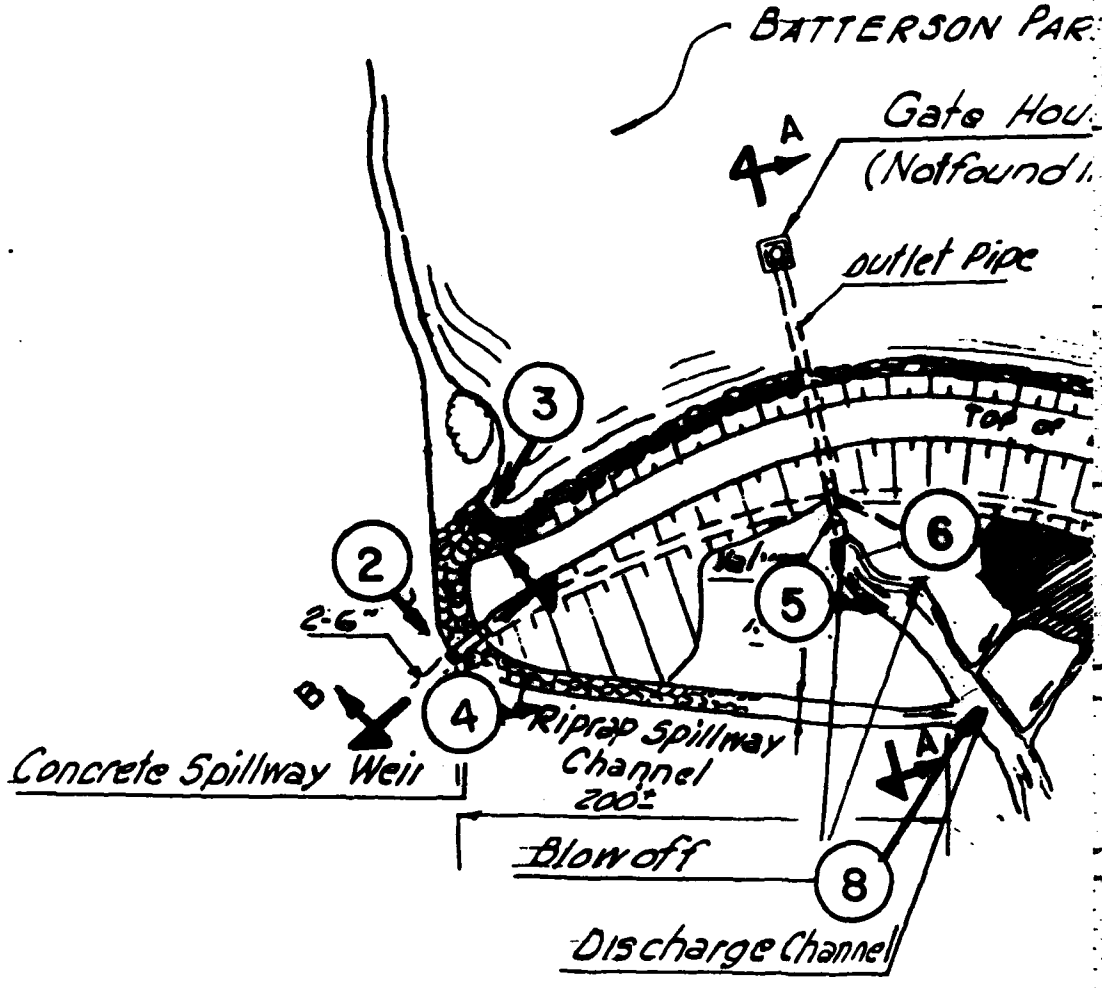
PIPER BROOK CONNECTICUT

SCALE: Not to Scale

DATE : Nov. 1978

3

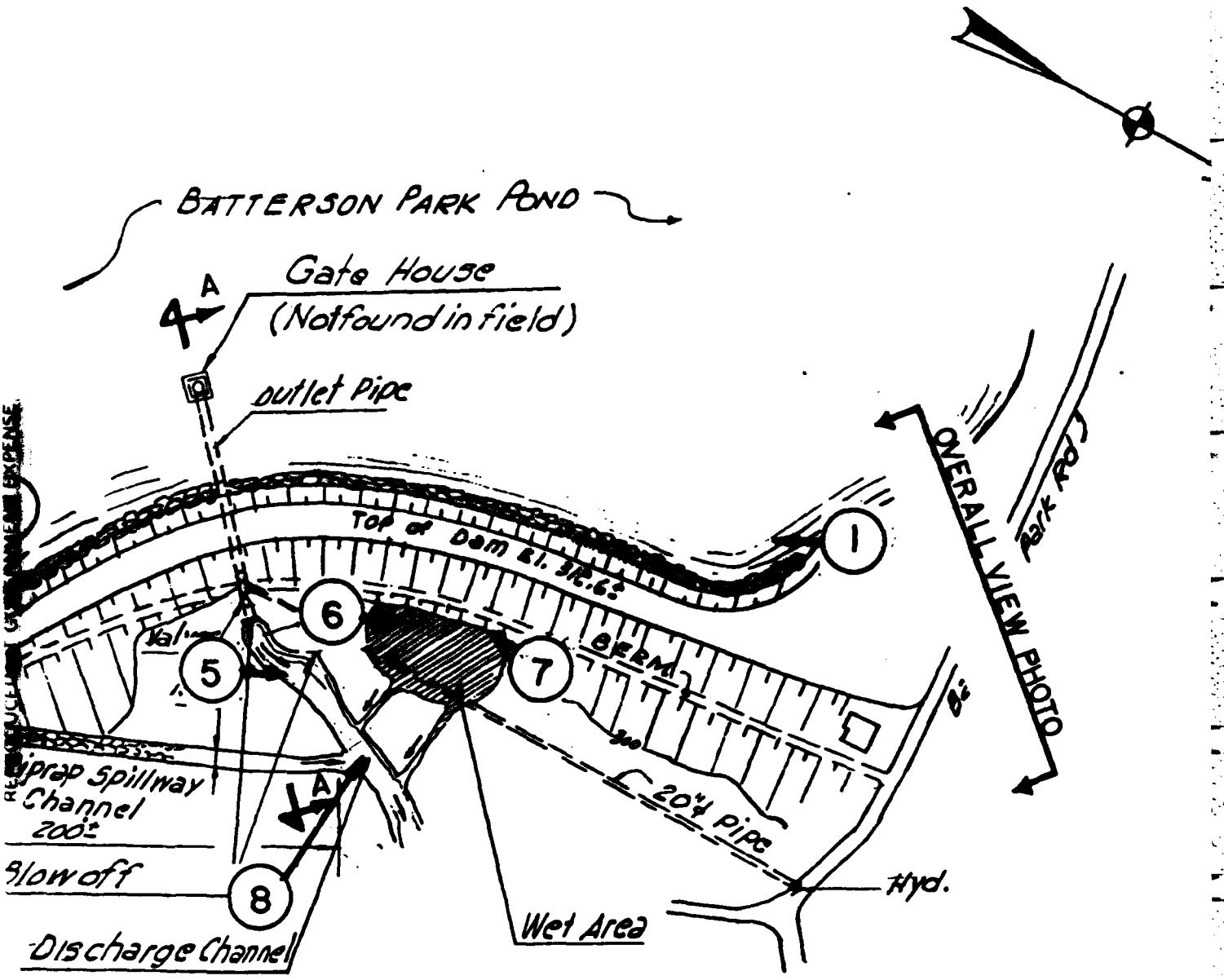
APPENDIX C



PLAN

NOTE: INFORMATION TAKEN FROM DRAWINGS SUPPLIED BY THE METROPOLITAN DISTRICT COMMISSION OF HARTFORD.

(2) DENOTES PHOTO LOCATI



PLAN

DENOTES PHOTO LOCATION 2

STORCH ENGI
WETHERSFIELD, C
NATIONAL PROC
BATT
PIPER BRO

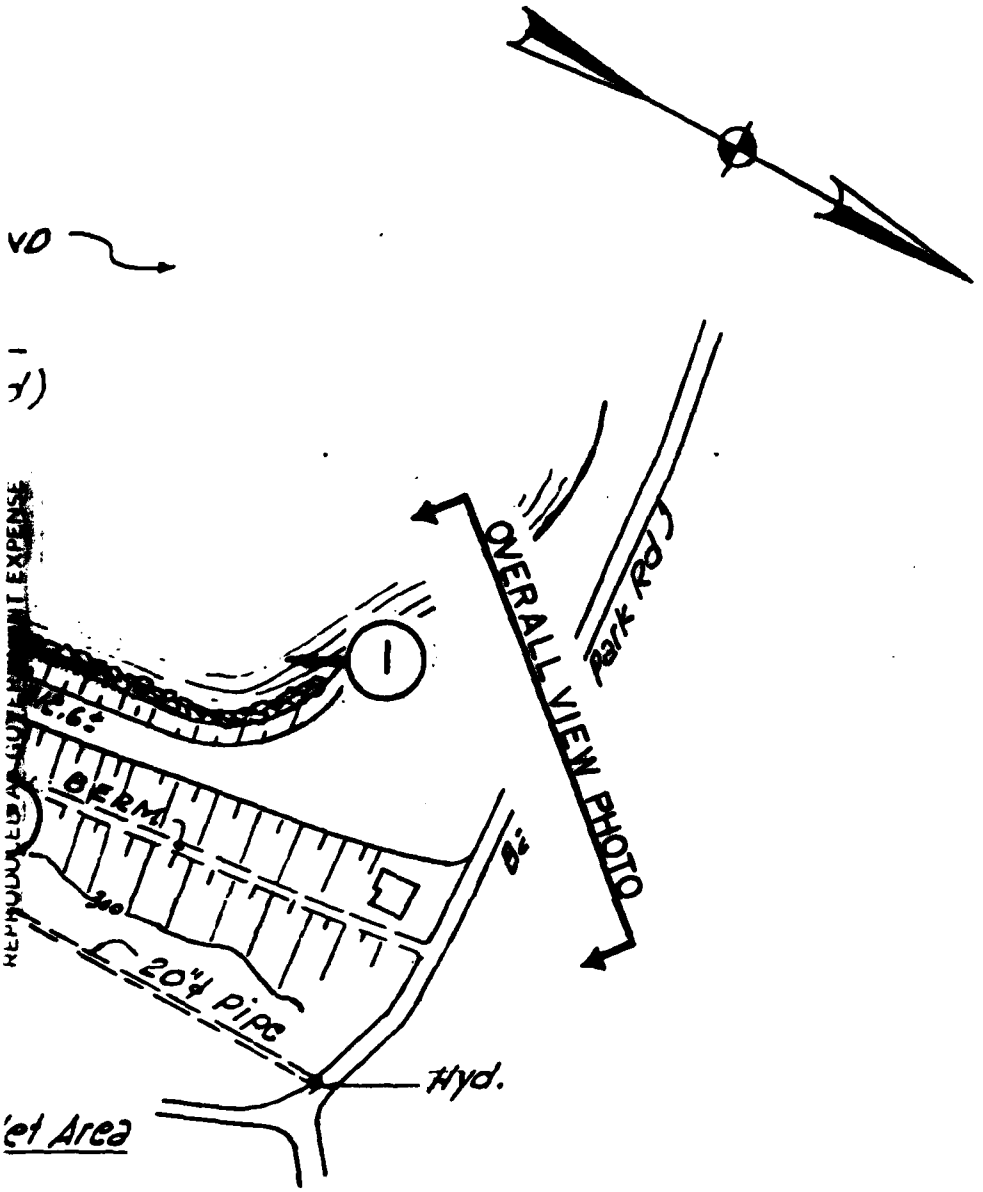


PLATE-3

STORCH ENGINEERS WETHERSFIELD, CONNECTICUT	U.S. ARMY ENGINEER DIV. NEW ENGLAND CORPS OF ENGINEERS WALTHAM, MASS.

NATIONAL PROGRAM OF INSPECTION OF NON-FED. DAMS

BATTERSON PARK POND DAM

PIPER BROOK CONNECTICUT

SCALE: Not to Scale

DATE : Nov. 1978

3

PHOTO 1

UPSTREAM FACE OF DAM

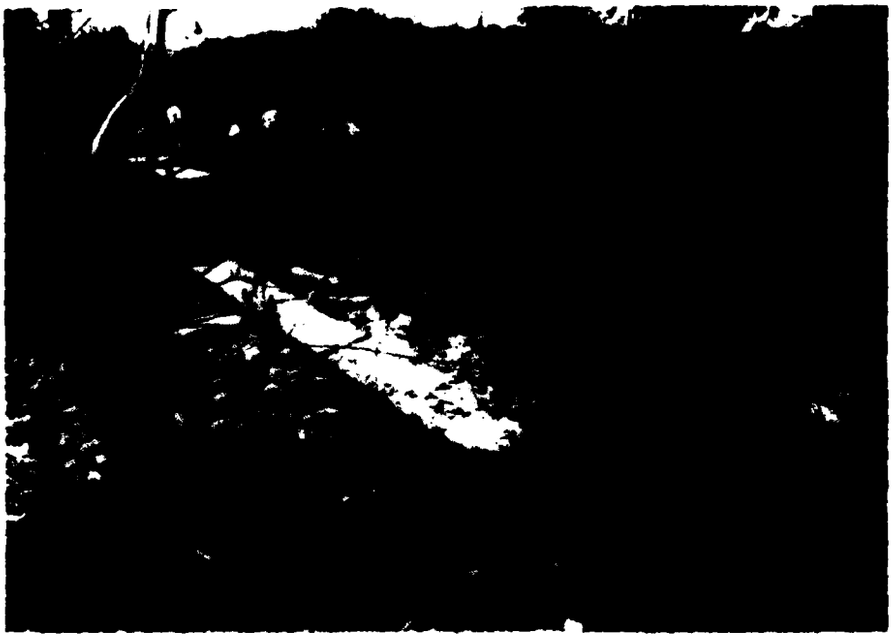


PHOTO 2

CREST OF EMERGENCY SPILLWAY

PHOTO 3

UPSTREAM SPILLWAY CHANNEL

PHOTO 4

DOWNSTREAM SPILLWAY CHANNEL

PHOTO 5

DOWNSTREAM BLOWOFF AT TOE OF DAM

PHOTO 6

WET AREA AT TOE OF DAM

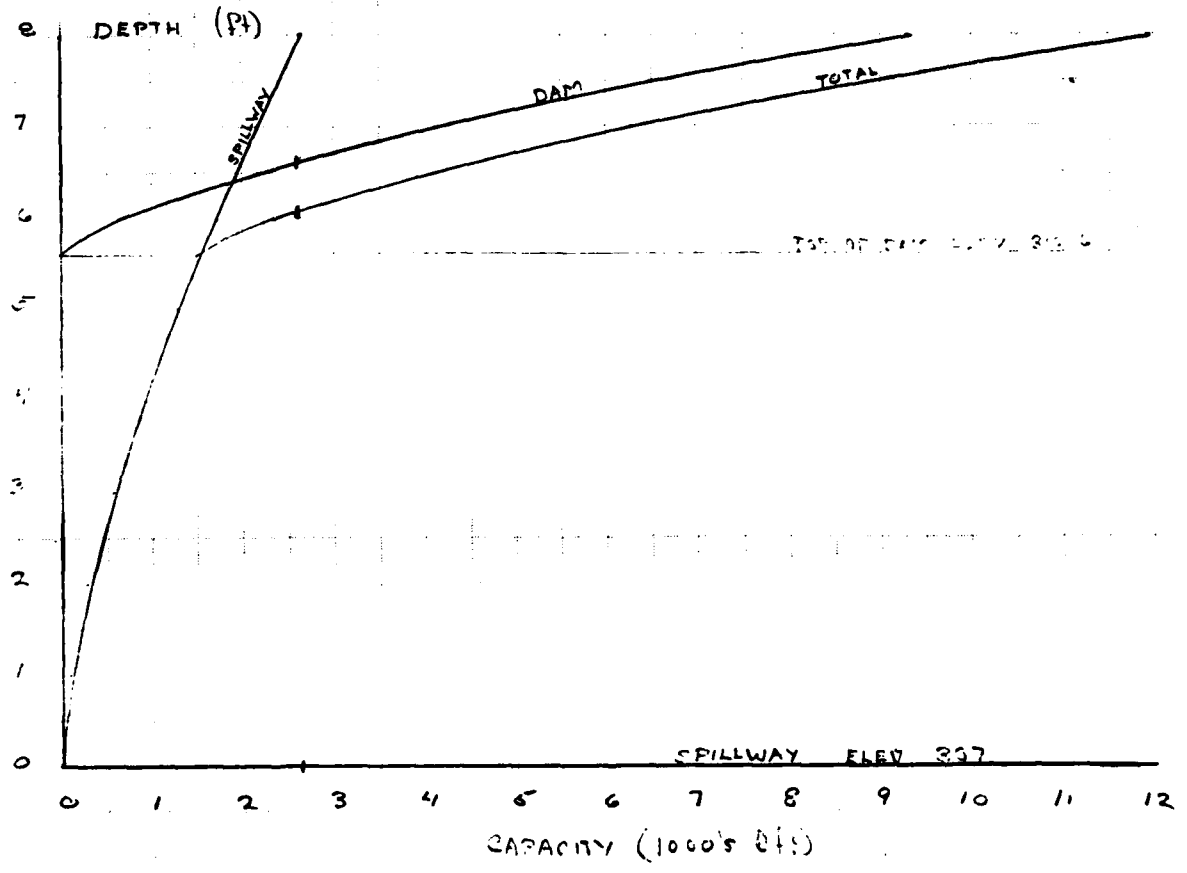
APPENDIX D

STORCH ENGINEERS
Engineers - Landscape Architects
Planners - Environmental Consultants

BATTERSON PARK POND DAM

STAGE DISCHARGE

	SPILLWAY L=35'			DAM L=1000'			
ELEV	H	C	Q	H	C	Q	Q_{TOTAL}
307	0		0				
308	1	2.64	92.4				
309	2	2.76	273				
310	3	3.05	555				
311	4	3.32	930				
312	5	3.32	1300				
312.6	5.6	3.32	1540				
313	6.0	3.32	1710	.4	2.5	630	2340
314	7.0	3.32	2150	1.4	2.5	4140	6290
315	8.0	3.32	2630	2.4	2.5	9295	11925

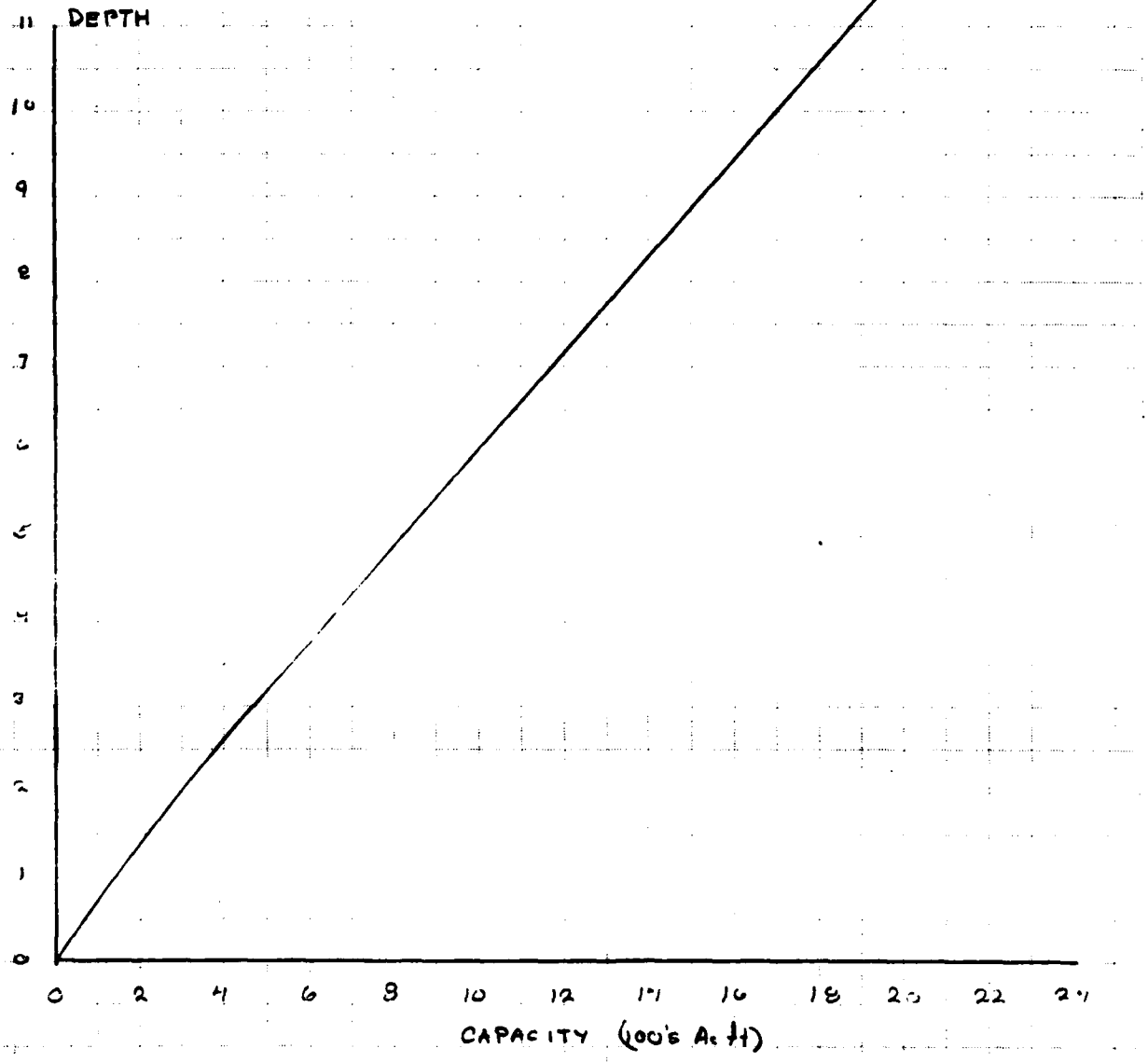


STORCH ENGINEERS
Engineers - Landscape Architects
Planners - Environmental Consultants

BATTERSON PARK POND DAM

CAPACITY CURVE

ELEV	DEPTH	AREA	AVG AREA	VOL	Σ VOL
307		150			0
	3		155	465	
310		160			465
	10		176	1760	
320		192			2225



BATTERSON PARK POND DAM
DETERMINATION OF SDF & PMF

DRAINAGE AREA - 4.68 SM

INFLOW - 1500 cfs/SM *

$PMF_I = 1500 \times 4.68 = 7020$ cfs

Determine the effect of surcharge storage on the Maximum Probable Discharge.

① $Q_{P1} = 7020$ cfs

② a. $H_1 = 7.15'$
b. $STOR_1 = 4.81''$
c. $Q_{P2} = Q_{P1}(1 - STOR/19) = 7020(1 - 4.81/19) = 5240$ cfs

③ a. $H_2 = 6.8'$
$STOR_2 = 4.52''$
b. $STOR_A = 4.665''$
$Q_{PA} = 7020(1 - 4.665/19) = 5295$ cfs
$H_A = 6.81 =$ ELEV 313.81
$STOR_A = 4.5''$ OK

$PMF_o = 5295$ cfs

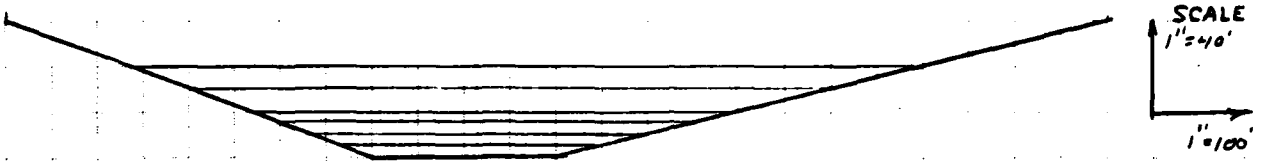
Capacity of the spillway when the pond elevation is at the top of the dam.

$Q = 1540$ cfs or 29.1 % of the PMF

* Inflow of 1500 cfs/SM is below that for rolling terrain, however the effect of Dead Wood Swamp upstream reduces this flow. See Section 5.1 of text for explanation.

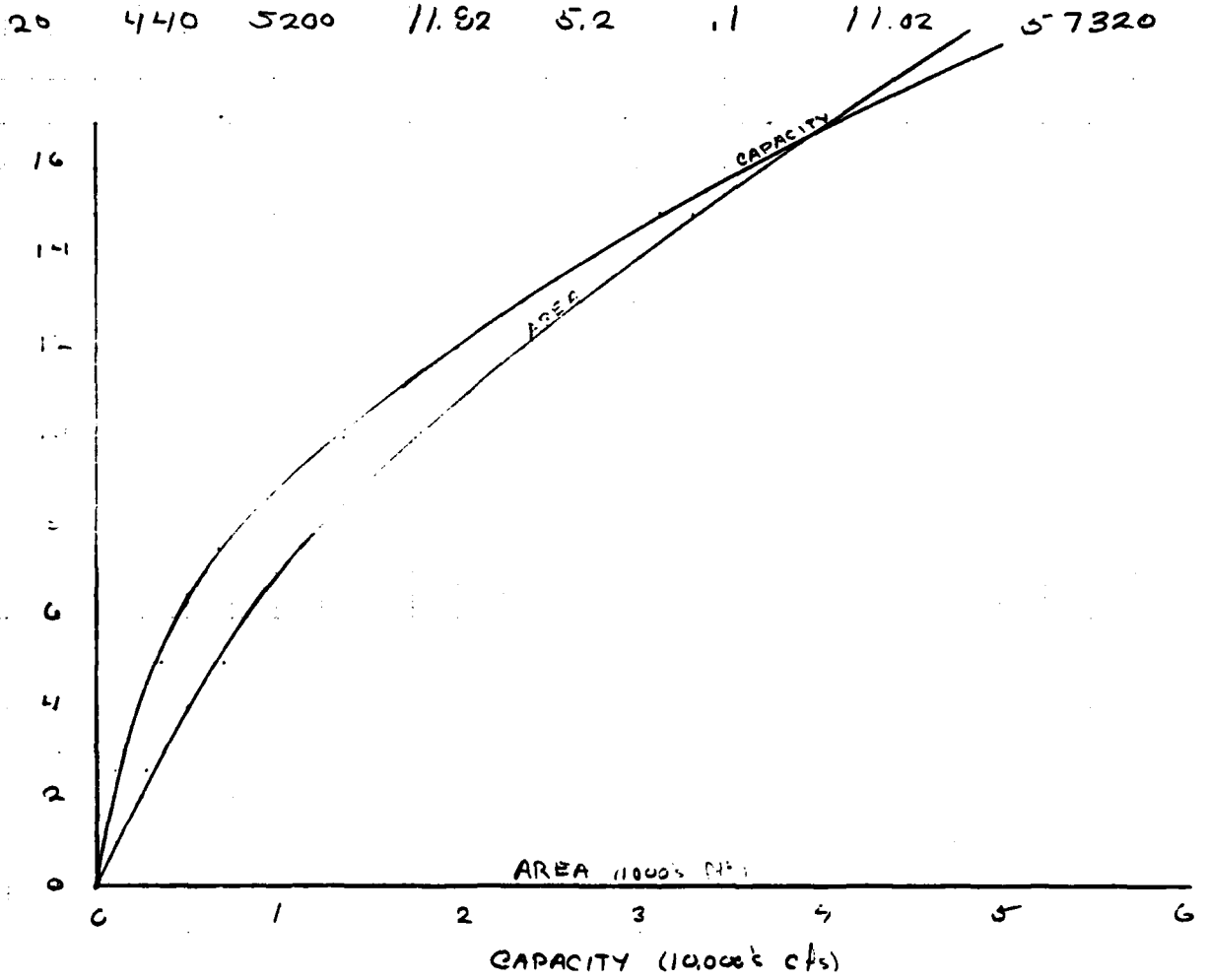
STORCH ENGINEERS
Engineers · Landscape Architects
Planners · Environmental Consultants

BATTERSON PARK POND DAM
TYPICAL SECTION



n = .07 S = .01

D	WP	A	R	$R^{2/3}$	$S^{1/2}$	V	Q
2.5	180	287	2.20	1.69	.1	3.6	1033
5.0	180	700	3.9	2.47	.1	5.25	3676
7.5	230	1125	4.9	2.88	.1	6.12	6885
10	260	1800	6.9	3.63	.1	7.72	13890
15	360	3300	9.4	4.46	.1	9.48	31284
20	440	5200	11.82	5.2	.1	11.02	57320



"RULE OF THUMB" GUIDANCE FOR ESTIMATING DOWNSTREAM DAM FAILURE HYDROGRAPHS.

SECTION I @ DAM

① $S = 2730$ Ac ft

② $Q_{P1} = 8/27\ W_b \sqrt{g}\ y^{1.5} = 8/27\ 300 \sqrt{g}\ 20^{1.5} = 45\,115$ cfs

SECTION II @ Lower Pond

④ a. $H_1 = 17.8'$ $A_1 = 4300$ ft² $L = 7500'$

$V_1 = 740$ Ac ft

b. $Q_{P2} = 45115\,(1 - 740/2730) = 32\,886$ cfs

$H_2 = 16.4'$ $A_2 = 3850$ ft²

$A_{avg} = 4075$ ft² $V_{avg} = 701$ Ac ft

$Q_{P2} = 45115\,(1 - 701/2730) = 33,530$ cfs

$H_2 = 15.9'$ $A_2 = 3650$ ft²

SECTION III @ Junction with Piper Brook

④ a. $H_2 = 15.9'$ $A_2 = 3650$ ft² $L_2 = 9000'$

$V_2 = 724$ Ac ft

b. $Q_{P3} = 33530\,(1 - 724/2730) = 24\,640$ cfs

$H_3 = 13.3'$ $A_3 = 2750$ ft²

$A_{avg} = 3200$ ft² $V_{avg} = 691$ Ac ft

$Q_{P3} = 33530\,(1 - 691/2730) = 25\,410$ cfs

$H_3 = 13.5'$ $A_3 = 2850$ ft²

SCALE 1:24000

CONTOUR INTERVAL 10

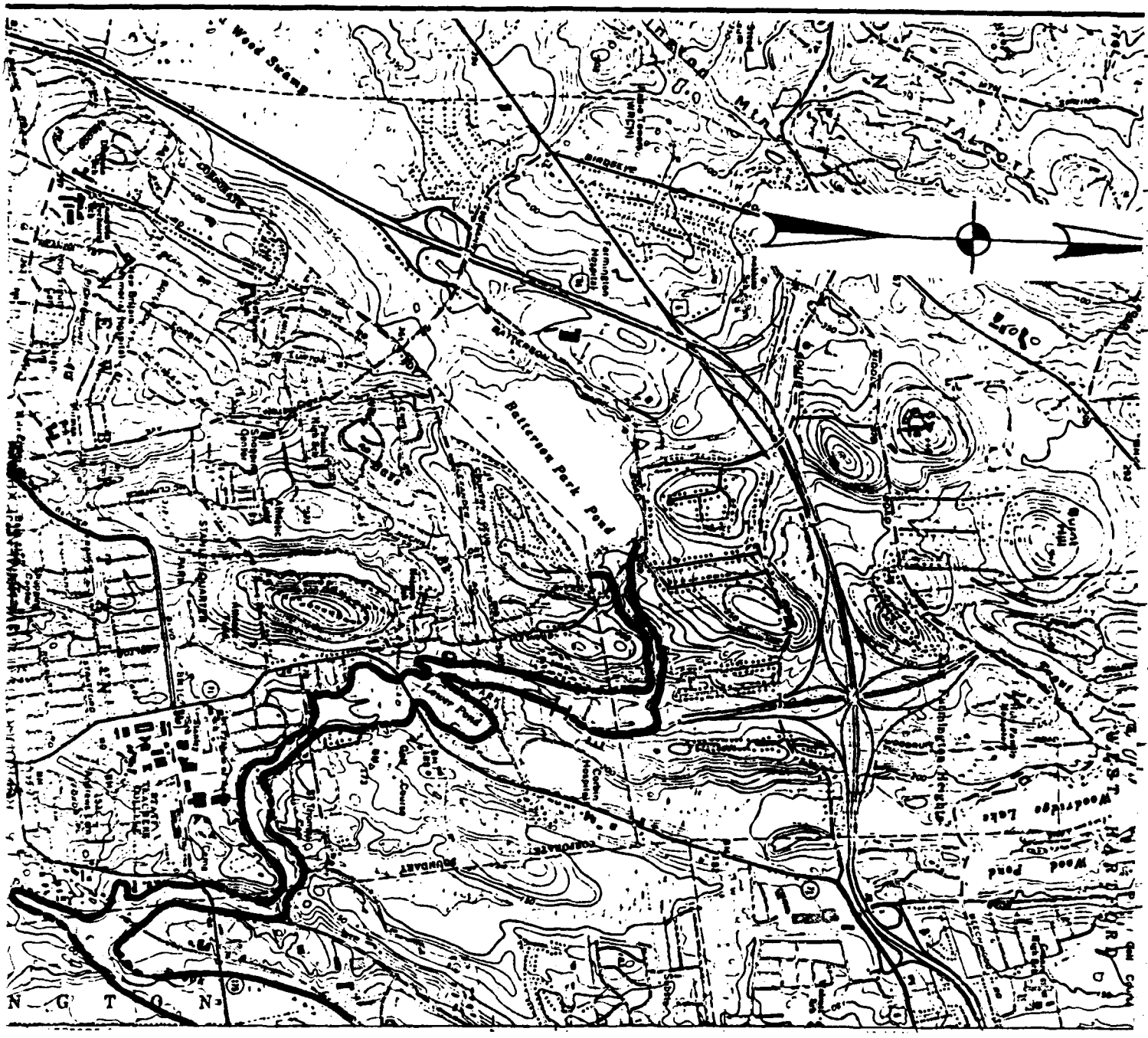
DATUM IS MEAN SEA LEVEL

LEGEND

DENOTES LIMITS OF FLOODING IN CASE OF DAM FAILURE

1

2



SCALE 1:24000

1 MILE

1000 0 1000 2000 3000 4000 5000 6000 7000 FEET

1 0 1 KILOMETER

CONTOUR INTERVAL 10 FEET

DATUM IS MEAN SEA LEVEL

STORCH ENGINEERS

WETHERSFIELD, CONNECTICUT

NATIONAL PROGRAM OF IN

BATTERSON

PIPER BROOK

2

1 MILE

1000 FEET

1 KILOMETER

PLATE-4

STORCH ENGINEERS WETHERSFIELD, CONNECTICUT	U.S. ARMY ENGINEER DIV. NEW ENGLAND CORPS OF ENGINEERS WALTHAM, MASS.

NATIONAL PROGRAM OF INSPECTION OF NON-FED. DAMS

BATTERSON PARK POND DAM

PIPER BROOK CONNECTICUT

SCALE: AS SHOWN

DATE : Nov. 1978

LEGEND

DENOTES DRAINAGE AREA

FROM U.S.G.S. QUAD. SHEET
NEW BRITIAN , CONNECTICUT

PLATE 5

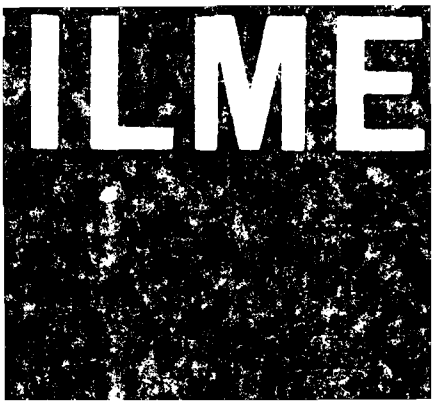
U.S.ARMY,CORPS OF ENGINEERS
NEW ENGLAND DIVISION
WALTHAM, MASS.

SCALE

DRAINAGE AREA MAP

APPENDIX E

INFORMATION AS CONTAINED IN THE NATIONAL INVENTORY OF DAMS


ILME